

Claims

1. Screw-centrifugal pump (1) comprising a pump housing (3) having an inlet opening (3c) and also an impeller (2) arranged within the pump housing (3) and rotatable about an axis of rotation (2d) in a direction of rotation (4a), the impeller (2) having a spirally extending blade entry edge (2a), characterized in that a guide vane (5) projecting into the interior space of the impeller (2) is disposed in the region of the inlet opening (3c).
5
2. Screw-centrifugal pump (1) in accordance with claim 1, characterized in that the guide vane (5) is displaceable in the direction of the axis of rotation (2d) and fixably mounted.
10
3. Screw-centrifugal pump (1) in accordance with one of the preceding claims, characterized in that the guide vane (5) has a guide vane edge (5a) which, in the direction of rotation (4a), increasingly projects in the direction of the axis of rotation (2d) into the interior space of the impeller (2).
15
4. Screw-centrifugal pump (1) in accordance with claim 3, characterized in that the guide vane edge (5a) forms a fixed three-dimensional curve, in that the blade entry edge (2a) forms a rotatable three-dimensional curve and that these two three-dimensional curves are designed and extend in a mutually matched manner such the guide blade edge (5a) has a guide blade edge section (5b) and the blade entry edge (2a) has a blade edge section (2b) in which the guide vane edge (5a) and the blade entry edge (2a) have a mutual spacing de-
20
25

pending on the position of the impeller (2) or mutually touch one another.

- 5 5. Screw-centrifugal pump (1) in accordance with claim 4, characterized in that a respective point (P1, P2) results within both the blade edge section (2b) and also within the guide vane edge section (5b) which have the smallest mutual spacing between the blade edge section (2b) and the guide vane edge section (5b), with these points (P1, P2) moving in the flow direction (S) on rotation of the impeller (2).
- 10 6. Screw-centrifugal pump (1) in accordance with claim 5, characterized in that the blade edge section (2b) has a tangent (T1) at the point (P1), in that the guide vane edge section (5b) has a tangent (T2) at the point (P2) and in that these two tangents (T1, T2) form an intersection
- 15 angle (α) of at least 10 degrees when considered from the inlet opening (3c).
- 20 7. Screw-centrifugal pump (1) in accordance with claim 6, characterized in that the intersection angle (α) lies between 30 degrees and less than 180 degrees, in particular between 60 degrees and 120 degrees.
- 25 8. Screw-centrifugal pump (1) in accordance with one of the claims 4 to 7, characterized in that the blade edge section (2b) and/or the guide vane edge section (5b) is formed at least partly as a cutting edge.
9. Method for the conveying of a liquid permeated with solid additions by means of a screw-centrifugal pump (1) characterized in that the liquid is directed with the aid of a guide vane (5) to the blade entry

edge (2a) of a rotating impeller (2) in such a way that at least one part of the solid additions slides along the blade entry edge.

10. Method in accordance with claim 9, characterized in that a guide
5 vane edge (5a) of the guide vane (5) and the blade entry edge (2a) mutually cooperate when the impeller (2) is rotating such that the solid addition located between the blade entry edge (2a) and the guide vane edge (5a) is mechanically comminuted by the blade and vane edges (2a, 5a) and/or shifted in the flow direction (S).